

REMARKS

Claims 1-20 are pending, including independent claims 1, 8, 13, and 17. All claims have been rejected on the basis of prior art.

Applicants' invention generally relates to a noise reduction circuit comprising two directional microphones that are positioned close together but with different orientations relative to a speaker's vocalizing direction. An adaptive filter simulates a noise signal outputted from a primary microphone by using a noise signal outputted from the other microphone, and subtracts the simulated noise signal from the output of the primary microphone. More specifically, Applicants' invention relates to the optimization of such a noise reduction circuit, including improvements in the placement and orientation of the microphones, and in the circuitry itself.

The Examiner relies on USP 5,796,819 ("Romesburg") as an anticipating reference for claims 8, 11-12, and 17. USP 6,430,295 ("Handel") was cited as an anticipating reference for claim 13. USP 5,471,538 ("Sasaki") was cited, as rendering obvious, claims 1, 8 and 11-13. USP 5,442,813 ("Walters") was cited to show microphones positioned on a sun visor. EP 457,176 ("Lange") was cited to show a noise reduction system where one microphone is positioned above the face of a speaker. USP 5,473,702 ("Yoshida") was also cited as a secondary reference.

Applicants have amended the claims to more specifically recite the optimized configurations discovered by Applicants, which configurations are not described or suggested in the cited art. In particular, Claim 1 has been amended to recite that the two microphones are positioned in front of and above the position of the speaker's mouth by approximately the same distance, one microphone is oriented to substantially face the speaker's vocalizing direction, and the second microphone is oriented at about 45° with respect to the speaker's vocalizing direction. This improved configuration is supported in the application, e.g., at page 11, lines 9-21, and page 12, lines 26-31. Dependant claims 5-7 have been cancelled, and new claim 21 has been added to more fully protect Applicants' invention.

Independent claim 8 has been amended to recite that the microphones are spaced apart about 9 cm, one microphone is oriented to substantially face the speaker's vocalizing direction, and the second microphone is oriented at about 60° with respect to

the speaker's vocalizing direction. This improved configuration is supported in the application, e.g., at page 11, lines 22-24, and page 13, lines 1-8. Dependent claim 10 has been cancelled.

Independent claim 13 has been amended to recite a circuit configuration in which each microphone provides an output to an adaptive signal processor, and both processors execute adaptive signal processing to minimize the power of an error signal. This improved configuration is supported in the application, e.g., at page 14, lines 1-10.

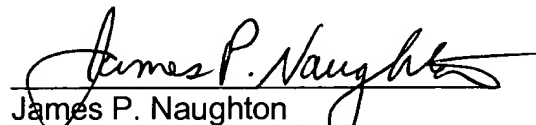
Independent claim 17 has been amended to recite that one microphone is positioned at a height substantially directly above a speaker's face and the other microphone is spaced to the rear (occipital side) by about 1 cm to 5 cm. This improved configuration is supported in the application, e.g., at page 14, line 13 to page 18, line 5.

New claims 22-29 are added to more completely protect Applicants' invention. Independent claim 22 is directed to an improved configuration in which both microphones are oriented substantially perpendicularly to the speaker's vocalizing direction and are spaced apart by about 7.5 cm. This claim is supported in the application, e.g., at page 13, lines 9-15.

Independent claim 26 is directed to an improved configuration in which one microphone is oriented substantially perpendicularly to the speaker's vocalizing direction, the other microphone is oriented at an acute angle relative to the orientation of the one microphone, and the microphones are spaced apart by about 2 cm. This claim is supported in the application, e.g., at page 13, lines 16-24.

Applicants submit that their improved configurations, as described in the amended and newly added claims, are patentable over the cited art. Accordingly, Applicants respectfully request reconsideration and allowance of this application.

Respectfully submitted,


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